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ABSTRACT

The 39-day Summer Academic Skills Achievement Program in Franklin County, Ohio, was designed to increase the basic reading and mathematics skills of persons of at least high school age. It enabled clients to earn a full credit and up to $200 ($3.35 an hour) for successfully completing the program. Among the major findings of an evaluation of the program are the following: (1) a total of 216 clients were enrolled, and the average daily attendance was 167.8; (2) the age of the clients ranged from 14 to 20 with a median age of 16; (3) about half the clients were males, half females; (4) approximately 87 percent of the clients were black, and 11 percent were non-minority; (5) data from the 137 clients who took a reading or mathematics pretest and posttest, and who attended 80 percent of the program, revealed that there was a statistically significant improvement in their reading comprehension and mathematics computation; (6) the median grade equivalent of reading pretest scores was 7.3; of posttest scores, 8.7; (7) of the 136 clients in the evaluation sample, approximately 46 percent gained one or more years in reading; (8) the median grade equivalent of mathematics pretest scores was 7.4, and the median posttest scores, 8.5; and (9) of the 121 clients in the evaluation sample, approximately 58 percent gained one or more years in mathematics. Due to several problems it was not possible to collect posttest data on non-client individuals who served as controls; therefore it was impossible to determine the degree to which all the positive change could be attributed to the program. Data are presented on 24 tables and figures. (Author/BJV)

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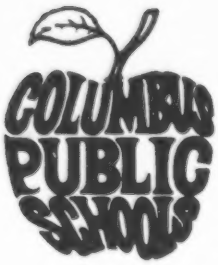
Private Industry Council of Franklin County
Job Training Partnership Act

FINAL EVALUATION REPORT
SUMMER ACADEMIC SKILLS ENHANCEMENT PROGRAM
SUMMER 1987



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Private Industry Council of Franklin County
Job Training Partnership Act

FINAL EVALUATION REPORT
SUMMER ACADEMIC SKILLS ENHANCEMENT PROGRAM
SUMMER 1987

ABSTRACT

Program Description: The Summer Academic Skills Achievement Program was funded by the Private Industry Council of Franklin County through the Job Training Partnership Act. The purpose of the program was to increase the basic reading and mathematics skills of persons of at least high school age. The 39-day summer instructional program featured the Houghton Mifflin New Directions Reading Series and the Houghton Mifflin Individualized Computation Skills Series. Both homogeneous and heterogeneous class groupings were used as appropriate.

Clients who participated in the program could earn a full credit for successfully completing both the reading and mathematics parts of the program. Clients earned $3.35 per hour training allowance and could earn up to $200 for successfully completing the program.

Except for a full-time organizer/director, the program consultant, counselor, and teachers served on a part-time bases. The staff provided services to the 216 clients enrolled in the program and carried out non-instructional activities with non-clients who were to serve as a control group.

Evaluation Questions: The following evaluation questions were specified in the evaluation design of the program.

1. Were there statistically significant differences in gains from pretest to posttest between control and client individuals on the Reading Comprehension and Mathematics Computation Tests of the Comprehensive Tests of Basic Skills (CTBS)?

2. Were there changes from pretest to posttest in the number of clients who exhibited mastery, partial mastery, and non-mastery of the 11 objectives measured by the two tests of the CTBS?

3. What were the distribution of changes in grade eqdvalents and normal curve equivalents in Reading Comprehension and Mathematics Computation of clients from pretest to posttest on the CTBS?

4. What were the demographic characteristics and attendance rates of clients?

Evaluation Design: The evaluation design called for administering screening tests to approximately 3,000 low achieving individuals between the ages of 14-21 years. The screening tests to be used were the Reading Comprehension and the Mathematics Computation Tests of the Comprehensive Tests of Basic Skills

(CTBS). Level H, Form V of the CTBS was to be used. Based on the results of the screening tests, the lowest scoring individuals were to be randomly selected for placement in either the client group or the non-client group. The latter group would serve as a control group for the clients who would be served in the program. After the groups had been established and prior to the start of the program, both groups would be pretested with an alternate form (Form U) of the CTBS. At the end of the program, both groups would be posttested with the same tests. Client attendance, enrollment, and demographic information would be collected on a Pupil Census Form completed by program personnel.

Due to several problems it was not possible to carry out the screening procedure as planned nor to collect posttest data on non-client individuals. Therefore, the client and non-client comparisons called for in the evaluation design could not be carried out.

Major Findings: A total of 216 clients were enrolled in the program. The average daily membership of the program was 213.0. The average daily attendance of the program was 167.8. The chronological age of the clients ranged from 14 to 20 with a median age of 16. While the gender of the client group was approximately half males and half females, about 87% of the clients were black and 11% were non-minority.

The program evaluation sample was composed of the 137 clients who took a reading or mathematics pretest and a reading or mathematics posttest, and attended 80% (i.e., 31 days) of the 39-day instructional program. Analyses of the pretest-posttest data for these clients revealed that there was a statistically significant ($p < .001$) increase in the number of items correctly answered for both Reading Comprehension and Mathematics Computation.

Analysis of the change in the number of clients mastering the six reading and five mathematics objectives assess by the CTBS showed that there was statistically significant ($p < .05$) improvement for each objective.

An analysis of reading pretest scores showed that the median grade equivalent was 7.3, and the median posttest score was 8.7. Of the 136 clients in the evaluation sample, approximately 46% gained one or more years in reading. The same analysis for mathematics showed that the median pretest score was 7.4, and the median posttest score was 8.5. Of the 121 clients in the evaluation sample, approximately 58% gained one or more years in mathematics. In summary, the analyses used to answer Evaluation Questions 1-3 showed that clients made substantial gains in both reading and mathematics.

Summary/Recommendations

The clients did show substantial growth in reading and mathematics. Unfortunately, the loss of a comparison group made it impossible to determine the degree to which all the positive change could be attributed to the program.

Many of the constraints to the first-year operation of the program could be overcome by staring client recruitment, teacher selection, and general program organization in January. In general, an increase in process and product evaluation data could help identify methods of refining a program that has shown potential for improving the basic skills of a client group with a demonstrated need for such a program.

Private Industry Council of Franklin County
Job Training Partnership Act

FINAL EVALUATION REPORT
SUMMER ACADEMIC SKILLS ENHANCEMENT PROGRAM
SUMMER 1987

Program Description

The Summer Academic Skills Achievement Program was funded by the Private Industry Council of Franklin County through the Job Training Partnership Act. The purpose of the program was to increase the basic reading and mathematics skills of persons of at least high school age who demonstrated a need to improve their skills in these areas.

The program was modeled on the Columbus Public Schools Summer School Program. Clients of the program attended classes from 8:10-11:50 each morning and received approximately three and one-half hours of instruction each day. The program ran for eight weeks during the Summer of 1987.

The Houghton Mifflin New Directions Reading Series was used for reading instruction. It is a high interest - low reading ability type series. The CTBS Locator Test was used to establish classes of clients of homogeneous reading skills. The Houghton Mifflin Individualized Computation Skills Series was used for mathematics instruction. This is a completely individualized instructional program. Unlike the reading classes, heterogeneous grouping was used to set up the mathematics classes.

Clients were recruited by the Private Industry Council through media ads, posters, regular school counselors, and mass meetings at a local recreation center. Clients were told that they would earn a full credit for passing the reading and mathematics courses. One-half credit would be earned for passing either one of the two courses. In addition clients would earn a training allowance of $3.35 per hour. They were also told that they would earn $100 for each one-half credit they earned. The recruitment procedures resulted in an enrollment of 216 clients for the program.

The program staff included one part-time consultant, an organizer/director, a coordinator, 14 part-time teachers, and one part-time counselor. All staff members were certified teachers. They all received one week inservice before the program began. In addition, six part-time teachers were hired to administer and score tests given prior to the 39-day instructional program.

Evaluation Questions

Evaluation Questions 1: Were there statistically significant differences in gains from pretest to posttest between control and client individuals on the Reading Comprehension and Mathematics Computation Tests of the Comprehensive Tests of Basic Skills (CTBS)?

Evaluation Question 2: Were there changes from pretest to posttest in the number of clients who exhibited mastery, partial mastery, and non-mastery of the 11 objectives measured by the two tests of the CTBS?

Evaluation Question 3: What were the distribution of changes in grade equivalents and normal curve equivalents in Reading Comprehension and Mathematics Computation of clients from pretest to posttest on the CTBS?

Evaluation Question 4: What were the demographic characteristics and attendance rates of clients?

Evaluation Design

The evaluation design called for the administration of screening tests to approximately 3,000 low achieving individuals between the ages of 14-21 years. The screening tests to be used were the Reading Comprehension and the Mathematics Computation Tests of the Comprehensive Tests of Basic Skills (CTBS; 1981). Level H, Form V of the CTBS was to be used. Based on the results of the screening tests, the lowest scoring individuals would be randomly selected for placement in either the client group or the non-client group. The latter group would serve as a control group for the clients who would be served in the program. After the groups had been established and prior to the start of the program, both groups would be pretested with an alternate form (Form U) of the CTBS. At the end of the program both groups would be posttested with the same tests.

The Reading Comprehension Test is composed of 10 passages of text that the examinee is asked to read silently and answer a total of 45 multiple choice items. The 45 item are divided into six objectives. The Mathematics Computation Test is composed of 40 multiple choice items that are divided into five objectives. The six reading and five mathematics objectives are delineated in the Major Findings section of this report. In order to achieve an objective, the examinee must correctly answer approximately three-fourths of the items for that objective. Possible objective mastery scores are: mastery, partial mastery, and non-mastery.

The tests, which were machine scored by the test publisher, yield a variety of scores which include: number of items correct, national percentiles, normal curve equivalents, grade equivalents, scale scores, and objective mastery scores. Since the irregular nature of the educational background of the program participants made grade level assignments somewhat arbitrary, and since national percentiles and norm curve equivalents are determined by the combination of the number of correct items, grade level, and time of the school year the test was taken, it was not possible to use these two types of derived scores in the analyses. Derived scores that are dependent only on the number of items correct were used in the analyses. These include grade equivalents and objective mastery scores. The number of items correct on the pretest and the posttest was also analyzed.

The irregular nature of the educational background of program participants along with their anticipated low skill level in reading and mathematics contributed to the decision by program personnel to use a relatively low level of the CTBS. Level H was used for both the pretest and the posttest. This level is designed for pupils through grade eight. It was thought that a more difficult level of the test would produce invalid results due to the fact that examinees would have a tendency to guess at items that were too difficult for them. A later examination of the raw score distributions for both reading and mathematics revealed that the level of test difficulty was a good fit for the program examinees.

The locally constructed Pupil Census Form was used to collect attendance, enrollment, and demographic information on each client. The Pupil Census Form was completed by project personnel at the conclusion of the program.

In May 1987 the recruitment of client and non-client participants for the screening phase of the program was initiated. This phase was supposed to result in the collection of test data that could be used in the assignment of individuals to the client and non-client groups. However, it was found that recruitment efforts were not as successful as anticipated and there was insufficient time to achieve the recruitment of the desired number of pupils. However 216 pupils were enrolled in the program.

Constraints were also encountered in collecting posttest data on non-clients. The plan called for posttesting non-clients at their work sites. However, due to a lack of funding, the work sites were closed prior to the end of the program. Therefore, non-clients were not available for the completion of posttest activities.

Project personnel were able to collect pretest data on 828 individuals. Of this number 306 were assigned to the client group and 522 to the potential non-client group. At the end of the program in August 1987, posttest data were collected on 160 client pupils. The following section, Major Findings, gives detailed information on the results of the analyses that could be carried out given the data collection constraints experienced by program personnel.

Major Findings

The program evaluation design called for the collection and analysis of data to answer four evaluation questions. Since Evaluation Question 4 called for the presentation of demographic characteristics and attendance rates of all clients, the results for this question are presented first in this section of the report.

Demographic Characteristics and Attendance Rates

> Evaluation Question 4: What were the demographic characteristics and attendance rates of clients?

There were 216 clients enrolled in the 39-day instructional program. Client days of enrollment ranged from 30 to 39 with a median of more than 38 days of enrollment. Average daily membership for the program (total days of enrollment divided by 39 program days) was 213.0. Client days of attendance ranged from zero to 39 with a median of 34 days. Average daily attendance (total days of attendance divided by 39 program days) was 167.8. The chronological age of the clients ranged from 14 to 20 years with a median age of 16. Assigned grade level ranged from 8 to 12 with a median of 10. Table 1 contains the ethnic group and gender of the clients for whom these data were reported. Table 2 contains the rate of attendance (attendance divided by enrollment) for each demographic group. These data show that, for groups with eight or more pupils, non-minority clients had better attendance than black clients with black males having the lowest attendance rate.

As was detailed in the previous section of this report regarding the evaluation design, it was not possible to collect pretest-posttest data on both client and non-client groups. However, Pupil Census Form (PCF), pretest, and posttest data were collected on 155 clients. Except for attendance, the descriptive statistics for this group were quite similar to those presented in the previous paragraph for all clients enrolled. Attendance was considerable higher for the group that had PCF, pretest, and posttest data with the average being 4.4 days more than for the total client group. The 4.4 days represents about 11% of the 39-day instructional program.

Table 1

Ethnic Group and Gender of Clients
Enrolled in the Program

Ethnic Group	Gender				Total	
	Female		Male			
	N	%	N	%	N	%
Non-Minority	8	36.4	14	63.6	22	10.9
Black	90	51.7	84	48.3	174	86.6
Asia American	2	50.0	2	50.0	4	2.0
American Indian	0	0.0	1	100.0	1	.5
Total	100	49.8	101	50.2	201	100.0

Table 2

Attendance Rates of Clients
Enrolled in the Program

Ethnic Group	Gender				Total	
	Female		Male			
	N	Rate	N	Rate	N	Rate
Non-Minority	8	87.9	14	88.2	22	88.1
Black	90	85.4	84	77.5	174	81.6
Asia American	2	80.8	2	54.8	4	68.2
American Indian	0	0.0	1	82.1	1	82.1
Total	100	85.5	101	78.7	201	82.1

To be included in the pretest-posttest analyses used to answer Evaluation Questions 1 through 3, clients had to be in attendance at least 80% of the 39 instructional days. This gave assurance that the program had an opportunity to benefit the client. The 80% criterion represents approximately 31 days. Of the 155 clients who had a PCF, pretest, and posttest data, 137 attended at least 31 days. These 137 clients comprised the program evaluation sample which is the focus of the remainder of this section regarding Major Findings.

The days of enrollment of the clients in the evaluation sample ranged from 34 to 39 with a median of more than 38 days. Average daily membership for this group was 136.2 for the 137 clients. The days of attendance of the clients in the evaluation sample ranged from 31 to 39 days with a median of 36 days. Average daily attendance for the group was 125.9 for the 137 clients. The chronological age of the clients in the evaluation sample ranged from 14 to 19 with a median of approximately 16 years. Assigned grade level ranged from 8 to 12 with a median of 10. Table 3 contains the ethnic group and gender of clients in the evaluation sample.

Table 3

Ethnic Group and Gender of Clients
in the Evaluation Sample

Ethnic Group	Gender				Total	
	Female		Male			
	N	%	N	%	N	%
Non-Minority	5	35.7	9	64.3	14	10.3
Black	70	58.8	49	41.2	119	87.5
Asia American	1	1.3	1	50.0	2	1.5
American Indian	0	0.0	1	100.0	1	.7
Total	76	55.9	60	44.1	136	100.0

Reading and Mathematics Achievement Results

As was noted earlier, the program personnel were unable to collect pretest-posttest data on control individuals. Therefore, the analyses for Evaluation Questions 1-3 were limited to the pretest and posttest performance of client in the evaluation sample.

Since the irregular nature of the educational background of the program participants made grade level assignments somewhat arbitrary, and since national percentiles and normal curve equivalents are determined by the combination of the number of correct items, grade level, and time of the school year the test was taken, it was not possible to use these two types of derived scores in any of the analyses. Derived scores that are dependent only on the number of items correct were used in the analyses. These include grade equivalents, and objective mastery scores. The number of items correct on the pretest and the posttest was used in several analyses. The number of items correct on a test is generally considered to be an equal interval scale appropriate for use with parametric statistics.

The grade equivalent has a serious limitation in doing pretest-posttest comparisons. The grade equivalent is not an equal unit of measurement. The implication of this is that the distance between any two grade equivalents is not necessarily equal to the distance between any other two grade equivalents. Therefore, arithmetic operations should not be done with grade equivalents. They are used in this report as a general point of reference to where clients in the evaluation sample scored in terms of grade placement.

> Evaluation Question 1: Were there statistically significant differences in gain scores from pretest to posttest between control and client individuals on the Reading Comprehension and Mathematics Computation Tests of the CTBS?

Since data were not collected on a control group, analyses were carried out to determine if there were statistically significant differences from pretest to posttest for client individuals. Table 4 contains the results of the *t*-tests for correlated data for the Reading Comprehension and Mathematics Computation Tests. The differences between the number correct on the pretest and the posttest were statistically significant ($p < .001$) for both the reading and mathematics tests. The increase in the number of correct items for mathematics was substantial and approximately twice as great as that for reading.

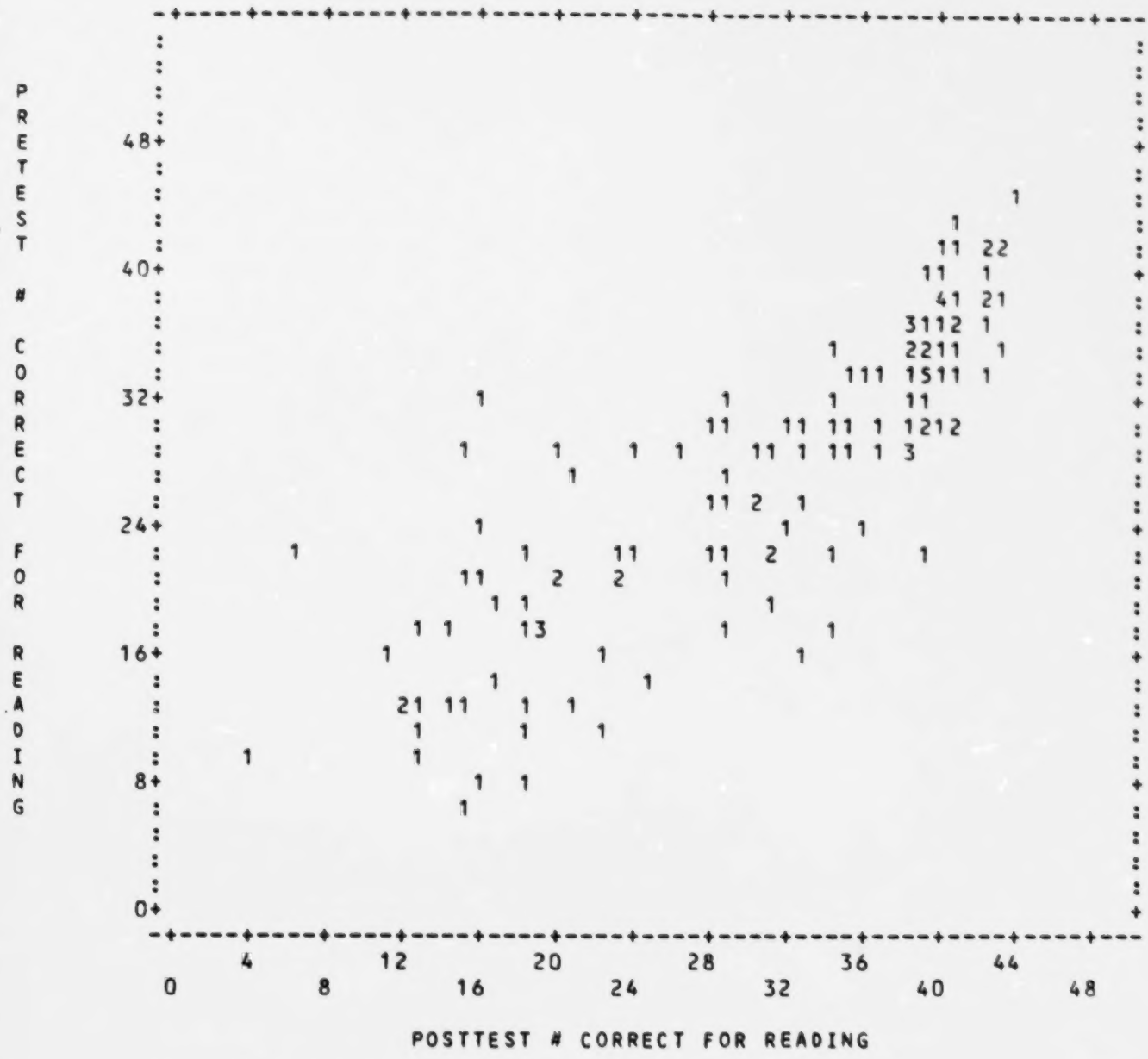
Figure 1 shows the number correct for the pretest plotted against the posttest for Reading Comprehension. Clients' scores below an imaginary line running from the lower left corner to the upper right corner of the plot represent clients whose scores were higher on the posttest than the pretest. Figure 2 shows the same information for Mathematics Computation. Of the 136 pupils represented in Figure 1, 101 (74.3%) had more reading items correct on the posttest than on the pretest. Of the 121 pupils represented in Figure 2, 104 (86.0%) had more mathematics items correct on the posttest than on the pretest.

Table 4

Pretest-Posttest Analysis
for Number of Items Correct

Test	No. of Items	N	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation	Change Mean	Change Standard Deviation	t Value	Degrees of Freedom
Reading Comprehension	45	136	27.4	9.2	30.6	10.2	3.2	5.5	6.8***	135
Mathematics Computation	40	121	19.4	8.9	25.8	10.2	6.5	6.2	11.6***	120

*** $p < .001$



136 CASES PLOTTED.

Figure 1. Plot of the number of Reading Comprehension items correct on the pretest and posttest. (Numbers in plot represent the number of pupils having the specified combination of pretest-posttest scores on the 45-item test.)

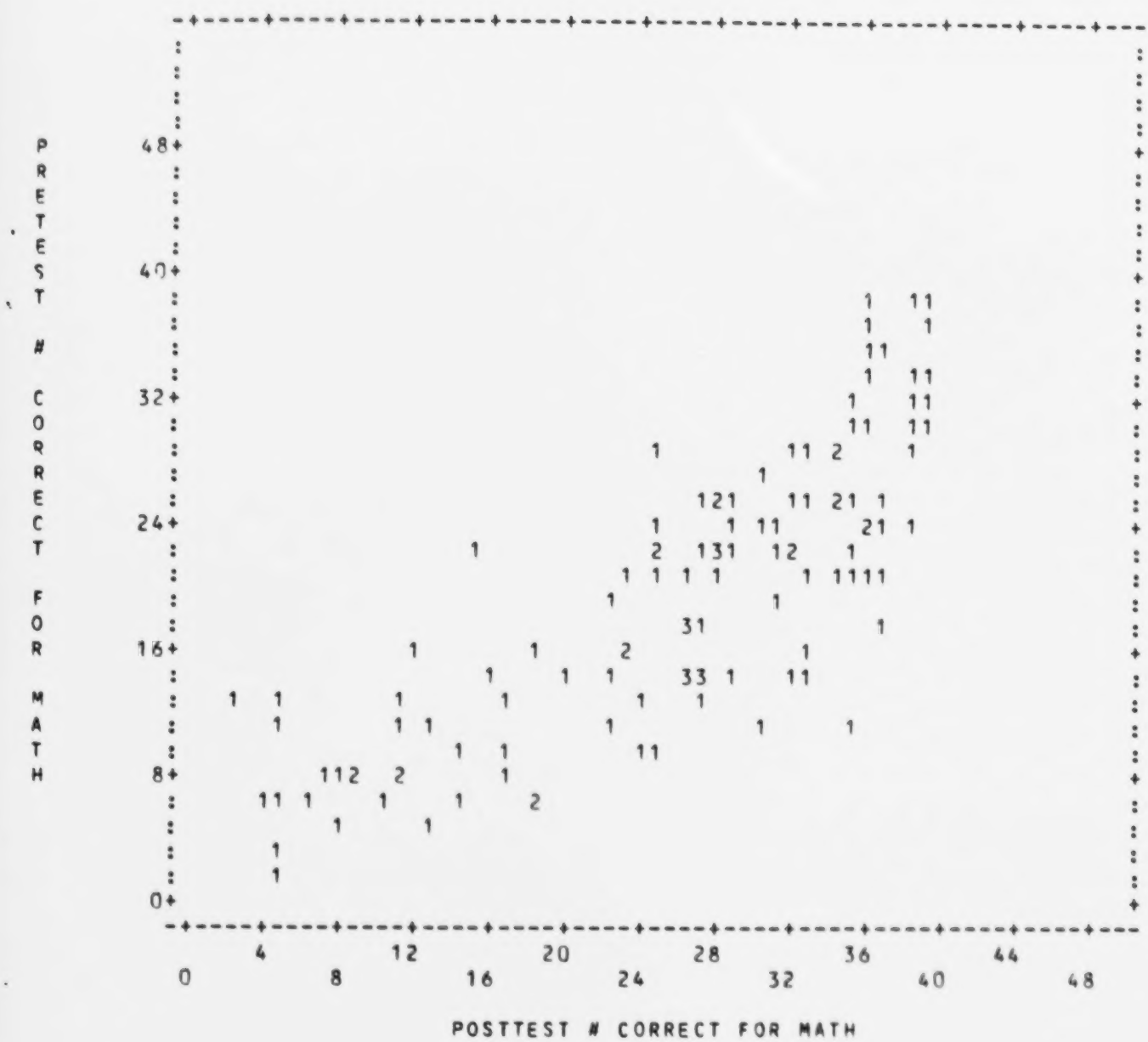


Figure 2. Plot of the number of Mathematics Computation items correct on the pretest and posttest. (Numbers in plot represent the number of pupils having the specified combination of pretest-posttest scores on the 40-item test.)

Except for gender, there were not enough clients to permit analysis by demographic variables. Subsequent analysis by gender did not show statistically significant differences between males' and females' pretest-posttest change scores for either reading or mathematics.

> Evaluation Question 2: Were there changes from pretest to posttest in the number of clients who exhibited mastery, partial mastery, and non-mastery of the 11 objectives measured by the two tests of the CTBS?

The following are the Six Reading Comprehension Test objectives and, in parentheses, the number of items measuring each objective.

Objective 30 - The student will extract details from a passage to answer who, want, where, or when questions (9).

Objective 31 - The student will analyze the feelings, traits, or motives of characters in a passage (5).

Objective 32 - The student will identify the main idea, the author's purpose or viewpoint, or the tone and mood expressed in a passage (5).

Objective 33 - The student will draw conclusions from or recognize cause-and-effect relationships in a passage (8).

Objective 34 - The student will differentiate between reality and fantasy, between fact and opinion, or between forms of writing (9).

Objective 35 - The student will recognize techniques of persuasive writing or figurative writing (9).

The following are the five Mathematics Computation Test objectives and, in parentheses, the number of items measuring each objective. Eight of the 40 items on the math test do not contribute to the objective mastery levels.

Objective 58 - The student will add decimals or fractions (8).

Objective 60 - The student will subtract decimals or fractions (8).

Objective 62 - The student will multiply decimals or fractions (6).

Objective 64 - The student will divide decimals or fractions (6).

Objective 65 - The student will solve computation problems involving integers (4).

As indicated in the evaluation question, there are three levels of objective mastery (i.e., non-mastery, partial mastery, and mastery). Also, if a pupil does not respond to a sufficient number of items for an objective, that objective is scored as "omitted." This generally occurs when a pupil does not respond to a series of items that appear toward the end of a test. Because of the very small number of "omits", they were excluded from the analyses.

Objective mastery scores are provided by the test publisher according to a sophisticated scoring method called Item Response Theory (IRT). This method takes into account the level of difficulty of the items a pupil answers correctly for purposes of assigning an objective mastery score. As a rule of thumb, the pupil must correctly answer about three-fourths of the items for a given objective in order to obtain a score indicating mastery of the objective.

Figures 3-13 give a crosstabulation of the pretest-posttest mastery scores for each of the 11 objectives. In these figures the pretest mastery level are given down the left side. The frequency and percent of change from pretest to posttest are given in the cells of each crosstabulation. An analysis of non-mastery pretest scores showed that for reading the greatest increase in the percent of pupils moving from non-mastery to either partial mastery or mastery was for Objective 33 that measures the pupil's ability to draw conclusions and recognize cause and effect. Of the 22 pupils (16.2%) who were at the non-mastery level on the pretest, 10 pupils (45.5%) scored at least at the partial mastery level on the posttest. For mathematics, the greatest increase in the percent of pupils moving from non-mastery to either partial mastery or mastery was for Objective 58 that measures the pupil's ability to add decimals and fractions. Of the 64 pupils (52.9%) who were at the non-mastery level on the pretest, 34 pupils (53.1%) scored at least at the partial mastery level on the posttest.

Since clients could also move from a pretest score indicating mastery to a lower mastery score, the preceding analyses that focused only on clients having a non-mastery pretest score can be somewhat misleading. A second analysis was done to determine the change in the percent of clients in the non-mastery category regardless of their pretest score. This analysis showed that for reading the greatest decrease in the non-mastery category was for Objective 34 that measures the client's ability to differentiate between reality and fantasy, fact and opinion, and between forms of writing. There was a decrease of 20 clients (14.7% of the 136 clients) for this objective. For mathematics, the greatest decrease in the non-mastery category was for Objective 64 that measures the client's ability to divide decimals or fractions. There was a decrease of 40 clients (33.1% of the 121 clients) for this objective.

To determine if the client's improvement in mastery level was statistically significant, the Wilcoxon Matched-Pairs Signed Ranks Test was run on the 11 objectives. Table 5 shows the statistical significance level for the 11 objectives, and the number and percent of the times the pretest mastery level was lower then, the same as, or higher than the posttest mastery level.

As the table shows the pretest-posttest changes in the mastery scores for all 11 objectives were statistically significant ($p < .05$), and 8 of the 11 objectives were statistically significant at the .001 level.

Table 5

Results of Wilcoxon Match-Pairs Signed Ranks
Test for Objective Mastery Scores

Objective	Posttest Lower Than Pretest N	%	Posttest Same As Pretest N	%	Posttest Higher Than Pretest N	%	z Value
30. Extracts details from passage	12	8.8	93	68.4	31	22.8	2.4**
31. Analyze feelings, traits, motives	8	5.9	95	69.9	33	24.3	3.3***
32. Identify main idea	12	8.8	93	68.4	31	22.8	2.2*
33. Draw conclusions; cause and effect	11	8.1	99	72.8	26	19.1	2.0*
34. Differentiate reality from fantasy	3	2.2	81	59.6	52	38.2	5.8***
35. Recognize techniques of persuasion	4	2.9	83	61.0	49	36.0	5.4***
58. Add decimals or fractions	4	3.3	57	47.1	60	49.6	6.4***
60. Subtract decimals or fractions	5	4.1	63	52.1	53	43.8	5.8***
62. Multiply decimals or fractions	3	2.5	63	52.1	55	45.5	6.1***
64. Divide decimals or fractions	2	1.7	65	53.7	54	44.6	6.2***
65. Compute problems with integers	4	3.3	80	66.1	37	30.6	4.6***

* $p<.05$
** $p<.01$
*** $p<.001$

		1	2	3	ROW TOTAL
	COUNT				
	ROW PCT	NON-MASTERY	PARTIAL MASTERY	MASTERY	
NON-MASTERY	1	26	6	3	35
		74.3	17.1	8.6	25.7
PARTIAL MASTERY	2	8	16	22	46
		17.4	34.8	47.8	33.8
MASTERY	3	2	2	51	55
		3.6	3.6	92.7	40.4
	COLUMN TOTAL	36	24	76	136
		26.5	17.6	55.9	100.0

NUMBER OF MISSING OBSERVATIONS = 1

Figure 3. Crosstabulation of pretest-posttest changes of mastery level scores for Objective 30 - Extracts details from passage. (Pretest mastery level scores appear down the left side and posttest mastery scores appear across the top.)

		1	2	3	ROW TOTAL
	COUNT				
	ROW PCT	NON-MASTERY	PARTIAL MASTERY	MASTERY	
NON-MASTERY	1	26	9	3	38
		68.4	23.7	7.9	27.9
PARTIAL MASTERY	2	5	16	21	42
		11.9	38.1	50.0	30.9
MASTERY	3	1	2	53	56
		1.8	3.6	94.6	41.2
	COLUMN TOTAL	32	27	77	136
		23.5	19.9	56.6	100.0

NUMBER OF MISSING OBSERVATIONS = 1

Figure 4. Crosstabulation of pretest-posttest changes of mastery level scores for Objective 31 - Analyze feelings, traits, motives. (Pretest mastery level scores appear down the left side and posttest mastery scores appear across the top.)

COUNT / ROW PCT	NON-MASTERY 1	PARTIAL MASTERY 2	MASTERY 3	ROW TOTAL
NON-MASTERY 1	15	8	2	25
	60.0	32.0	8.0	18.4
PARTIAL MASTERY 2	7	26	21	54
	13.0	48.1	38.9	39.7
MASTERY 3	2	3	52	57
	3.5	5.3	91.2	41.9
COLUMN TOTAL	24	37	75	136
	17.6	27.2	55.1	100.0

NUMBER OF MISSING OBSERVATIONS = 1

Figure 5. Crosstabulation of pretest-posttest changes of mastery level scores for Objective 32 - Identify main idea. (Pretest mastery level scores appear down the left side and posttest mastery scores appear across the top.)

COUNT / ROW PCT	NON-MASTERY 1	PARTIAL MASTERY 2	MASTERY 3	ROW TOTAL
NON-MASTERY 1	12	9	1	22
	54.5	40.9	4.5	16.2
PARTIAL MASTERY 2	6	28	16	50
	12.0	56.0	32.0	36.8
MASTERY 3	1	4	59	64
	1.6	6.3	92.2	47.1
COLUMN TOTAL	19	41	76	136
	14.0	30.1	55.9	100.0

NUMBER OF MISSING OBSERVATIONS = 1

Figure 6. Crosstabulation of pretest-posttest changes of mastery level scores for Objective 33 - Draw conclusions; cause and effect. (Pretest mastery level scores appear down the left side and posttest mastery scores appear across the top.)

COUNT / ROW PCT	NON-MASTERY 1	PARTIAL MASTERY 2	MASTERY 3	ROW TOTAL
NON-MASTERY 1	43	16	7	66
	65.2	24.2	10.6	48.5
PARTIAL MASTERY 2	3	20	29	52
	5.8	38.5	55.8	38.2
MASTERY 3			18	18
			100.0	13.2
COLUMN TOTAL	46	36	54	136
	33.8	26.5	39.7	100.0

NUMBER OF MISSING OBSERVATIONS = 1

Figure 7. Crosstabulation of pretest-posttest changes of mastery level scores for Objective 34 - Differentiate reality from fantasy. (Pretest mastery level scores appear down the left side and posttest mastery scores appear across the top.)

COUNT / ROW PCT	NON-MASTERY 1	PARTIAL MASTERY 2	MASTERY 3	ROW TOTAL
NON-MASTERY 1	38	14	4	56
	67.9	25.0	7.1	41.2
PARTIAL MASTERY 2	3	20	31	54
	5.6	37.0	57.4	39.7
MASTERY 3		1	25	26
		3.8	96.2	19.1
COLUMN TOTAL	41	35	60	136
	30.1	25.7	44.1	100.0

NUMBER OF MISSING OBSERVATIONS = 1

Figure 8. Crosstabulation of pretest-posttest changes of mastery level scores for Objective 35 - Recognize techniques of persuasion. (Pretest mastery level scores appear down the left side and posttest mastery scores appear across the top.)

COUNT / ROW PCT	NON-MASTERY 1	PARTIAL MASTERY 2	MASTERY 3	ROW TOTAL
NON-MASTERY 1	30 / 46.9	13 / 20.3	21 / 32.8	64 / 52.9
PARTIAL MASTERY 2	2 / 6.3	4 / 12.5	26 / 81.3	32 / 26.4
MASTERY 3		2 / 8.0	23 / 92.0	25 / 20.7
COLUMN TOTAL	32 / 26.4	19 / 15.7	70 / 57.9	121 / 100.0

NUMBER OF MISSING OBSERVATIONS = 16

Figure 9. Crosstabulation of pretest-posttest changes of mastery level scores for Objective 58 - Add decimals or fractions. (Pretest mastery level scores appear down the left side and posttest mastery scores appear across the top.)

COUNT / ROW PCT	NON-MASTERY 1	PARTIAL MASTERY 2	MASTERY 3	ROW TOTAL
NON-MASTERY 1	29 / 50.9	12 / 21.1	16 / 28.1	57 / 47.1
PARTIAL MASTERY 2	3 / 9.1	5 / 15.2	25 / 75.8	33 / 27.3
MASTERY 3		2 / 6.5	29 / 93.5	31 / 25.6
COLUMN TOTAL	32 / 26.4	19 / 15.7	70 / 57.9	121 / 100.0

NUMBER OF MISSING OBSERVATIONS = 16

Figure 10. Crosstabulation of pretest-posttest changes of mastery level scores for Objective 60 - Subtract decimals or fractions. (Pretest mastery level scores appear down the left side and posttest mastery scores appear across the top.)

COUNT / ROW PCT	NON-MASTERY 1	PARTIAL MASTERY 2	MASTERY 3	ROW TOTAL
NON-MASTERY 1	31 / 47.7	24 / 36.9	10 / 15.4	65 / 53.7
PARTIAL MASTERY 2	2 / 5.0	17 / 42.5	21 / 52.5	40 / 33.1
MASTERY 3		1 / 6.3	15 / 93.8	16 / 13.2
COLUMN TOTAL	33 / 27.3	42 / 34.7	46 / 38.0	121 / 100.0

NUMBER OF MISSING OBSERVATIONS = 16

Figure 11. Crosstabulation of pretest-posttest changes of mastery level scores for Objective 62 - Multiply decimals or fractions. (Pretest mastery level scores appear down the left side and posttest mastery scores appear across the top.)

COUNT / ROW PCT	NON-MASTERY 1	PARTIAL MASTERY 2	MASTERY 3	ROW TOTAL
NON-MASTERY 1	53 / 55.8	28 / 29.5	14 / 14.7	95 / 78.5
PARTIAL MASTERY 2	2 / 11.8	3 / 17.6	12 / 70.6	17 / 14.0
MASTERY 3			9 / 100.0	9 / 7.4
COLUMN TOTAL	55 / 45.5	31 / 25.6	35 / 28.9	121 / 100.0

NUMBER OF MISSING OBSERVATIONS = 16

Figure 12. Crosstabulation of pretest-posttest changes of mastery level scores for Objective 64 - Divide decimals or fractions. (Pretest mastery level scores appear down the left side and posttest mastery scores appear across the top.)

COUNT / ROW PCT		NON-MASTERY 1	PARTIAL MASTERY 2	MASTERY 3	ROW TOTAL
NON-MASTERY	1	71	27	3	101
		70.3	26.7	3.0	83.5
PARTIAL MASTERY	2	1	7	7	15
		6.7	46.7	46.7	12.4
MASTERY	3		3	2	5
			60.0	40.0	4.1
COLUMN TOTAL		72	37	12	121
		59.5	30.6	9.9	100.0

NUMBER OF MISSING OBSERVATIONS = 16

Figure 13. Crosstabulation of pretest-posttest changes of mastery level scores for Objective 65 - Compute problems with integers. (Pretest mastery level scores appear down the left side and posttest mastery scores appear across the top.)

Evaluation Question 3: What were the distribution of changes in grade equivalents and normal curve equivalents in Reading Comprehension and Mathematics Computation of clients from pretest to posttest on the CTBS?

As was mentioned earlier, it would have been inappropriate to use the normal curve equivalent in the analysis of the data. Therefore, the grade equivalent score was used to answer Evaluation Question 3. Figures 14-16 show the distribution of the grade equivalent pretest, posttest, and change for Reading Comprehension. As Figures 14 and 15 show, the pretest and posttest grade equivalents ranged from the lowest possible scores for the test (i.e., 4.0) to the highest possible score for the test (i.e., 12.9). The variability of the clients was quite high. The median pretest grade equivalent was 7.3, and the median posttest grade equivalent was 8.7. The median change for Reading Comprehension was eight months which represents the growth normally expected in four-fifths of an academic year. Of the 136 clients, 62 (45.6%) gained one year or more in the two-month program. The change score distribution for reading appears as Figure 16.

Figures 17-19 show the distributions of the pretest, posttest, and change for Mathematics Computation. As Figures 17 and 18 show, the pretest and posttest grade equivalents ranged from 4.3 to 12.9. As was true with reading, these scores represent the lowest and highest possible scores. Also as with reading, the variability in the mathematics skills of the clients was quite high. The median pretest grade equivalent for math was 7.4, and the median posttest grade equivalent was 8.5. The median change for Mathematics Computation was 12 months, which represents the growth normally expected in 1.2 academic years. Of the 121 clients, 70 (57.9%) gained one year or more in the two-month program. The change score distribution for mathmatics appears as Figure 19.

VALUE	FREQ	PCT	CUM PCT	VALUE	FREQ	PCT	CUM PCT	VALUE	FREQ	PCT	CUM PCT
4.0	15	11	11	5.8	3	2	38	8.7	6	4	74
4.6	2	1	12	6.0	4	3	41	8.9	8	6	80
4.7	4	3	15	6.2	1	1	42	9.1	4	3	83
4.9	3	2	18	6.5	2	1	43	9.3	4	3	86
5.0	5	4	21	6.9	7	5	48	9.6	4	3	89
5.2	3	2	23	7.3	6	4	53	9.9	4	3	92
5.3	6	4	28	7.7	6	4	57	10.5	3	2	94
5.4	1	1	28	8.1	7	5	62	12.2	3	2	96
5.6	3	2	31	8.3	5	4	66	12.9	5	4	100
5.7	7	5	36	8.5	6	4	70				

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Figure 14. Frequency distribution of pretest grade equivalents for Reading Comprehension Test. (The data appear in three sets of four columns. The "valve" is the grade equivalent valve.)

VALUE	FREQ	PCT	CUM PCT	VALUE	FREQ	PCT	CUM PCT	VALUE	FREQ	PCT	CUM PCT
4.0	9	7	7	5.7	3	2	29	8.7	6	4	54
4.3	2	1	8	5.8	2	1	31	8.9	3	2	56
4.6	4	3	11	6.0	1	1	32	9.1	2	1	57
4.7	4	3	14	6.2	1	1	32	9.3	3	2	60
4.9	2	1	15	6.9	3	2	35	9.6	11	8	68
5.0	6	4	20	7.3	7	5	40	9.9	13	10	77
5.2	3	2	22	7.7	3	2	42	10.5	10	7	85
5.3	3	2	24	8.1	4	3	45	12.2	9	7	91
5.4	2	1	26	8.3	2	1	46	12.9	12	9	100
5.6	2	1	27	8.5	4	3	49				

M I S S I N G D A T A

VALUE	FREQ	VALUE	FREQ	VALUE	FREQ
.	1				

VALID CASES 136 MISSING CASES 1

Figure 15. Frequency distribution of posttest grade equivalent for Reading Comprehension Test. (The data appear in three sets of four columns. The "valve" is the grade equivalent valve.)

VALUE	FREQ	PCT	CUM PCT	VALUE	FREQ	PCT	CUM PCT	VALUE	FREQ	PCT	CUM PCT
-3.6	1	1	1	.3	7	5	36	2.2	1	1	78
-2.3	1	1	1	.4	3	2	38	2.3	5	4	82
-1.7	2	1	3	.5	1	1	39	2.4	4	3	85
-1.6	1	1	4	.6	6	4	43	2.5	3	2	87
-1.5	1	1	4	.7	5	4	47	2.9	2	1	88
-1.1	2	1	6	.8	5	4	51	3.0	2	1	90
-1.0	1	1	7	.9	5	4	54	3.1	1	1	90
-.9	1	1	7	1.0	5	4	58	3.3	4	3	93
-.8	1	1	8	1.2	4	3	61	3.6	1	1	94
-.7	6	4	13	1.3	2	1	63	3.7	2	1	96
-.6	3	2	15	1.4	7	5	68	3.8	1	1	96
-.4	1	1	15	1.5	2	1	69	4.0	1	1	97
-.3	1	1	16	1.6	6	4	74	4.1	1	1	98
-.2	2	1	18	1.7	1	1	74	4.2	1	1	99
0.0	14	10	28	1.8	3	2	76	4.4	1	1	99
.2	4	3	31	2.0	1	1	77	4.5	1	1	100

M I S S I N G D A T A

VALUE	FREQ	VALUE	FREQ	VALUE	FREQ
	1				

VALID CASES 136 MISSING CASES 1

Figure 16. Frequency distribution of pretest-posttest grade equivalent change for Reading Comprehension Test. (The data appear in three sets of four columns. The "valve" is the grade equivalent valve.)

VALUE	FREQ	PCT	CUM PCT	VALUE	FREQ	PCT	CUM PCT	VALUE	FREQ	PCT	CUM PCT
4.3	11	8	8	7.2	5	4	44	8.5	5	4	83
4.6	8	6	14	7.3	3	2	46	8.7	2	1	85
5.0	3	2	16	7.4	7	5	51	8.9	2	1	86
5.4	2	1	18	7.5	4	3	54	9.3	3	2	88
5.8	6	4	22	7.7	9	7	61	9.6	3	2	90
6.1	4	3	25	7.8	6	4	65	10.3	2	1	92
6.4	3	2	27	8.0	8	6	71	11.1	1	1	93
6.6	8	6	33	8.1	7	5	76	11.7	2	1	94
6.8	5	4	37	8.2	3	2	79	12.5	1	1	95
7.0	5	4	40	8.3	1	1	79	12.9	7	5	100

M I S S I N G D A T A

VALUE	FREQ	VALUE	FREQ	VALUE	FREQ
	1				

VALID CASES 136 MISSING CASES 1

Figure 17. Frequency distribution of pretest grade equivalent for Mathematics Comprehension Test. (The data appear in three sets of four columns. The "valve" is the grade equivalent valve.)

VALUE	FREQ	PCT	CUM PCT	VALUE	FREQ	PCT	CUM PCT	VALUE	FREQ	PCT	CUM PCT
4.3	9	7	7	7.2	6	5	25	8.9	3	2	60
4.6	2	2	9	7.4	1	1	26	9.3	3	2	62
5.0	2	2	11	7.7	3	2	29	9.6	5	4	66
5.4	1	1	11	7.8	3	2	31	10.3	5	4	70
5.8	4	3	15	8.0	2	2	33	11.1	5	4	75
6.1	1	1	16	8.1	6	5	38	11.7	6	5	80
6.4	2	2	17	8.2	7	6	43	12.5	8	7	86
6.6	2	2	19	8.3	7	6	49	12.9	17	14	100
6.8	1	1	20	8.5	6	5	54				
7.0	1	1	20	8.7	4	3	57				

M I S S I N G D A T A

VALUE	FREQ	VALUE	FREQ	VALUE	FREQ
	15				

VALID CASES 122 MISSING CASES 15

Figure 18. Frequency distribution of posttest grade equivalent for Mathematics Computation Test. (The data appear in three sets of four columns. The "valve" is the grade equivalent valve.)

VALUE	FREQ	PCT	CUM PCT	VALUE	FREQ	PCT	CUM PCT	VALUE	FREQ	PCT	CUM PCT
-2.1	2	2	2	1.0	4	3	45	3.0	2	2	81
-1.5	1	1	2	1.1	3	2	48	3.1	2	2	83
-1.0	1	1	3	1.2	4	3	51	3.2	1	1	83
-.9	1	1	4	1.3	1	1	52	3.3	3	2	86
-.6	1	1	5	1.4	3	2	55	3.6	3	2	88
-.4	2	2	7	1.6	3	2	57	3.7	2	2	90
-.3	2	2	8	1.7	3	2	60	4.0	1	1	91
0.0	9	7	16	1.8	2	2	61	4.3	1	1	92
.1	1	1	17	1.9	3	2	64	4.4	1	1	93
.2	3	2	19	2.0	1	1	64	4.5	2	2	94
.3	3	2	21	2.1	3	2	67	4.8	1	1	95
.4	7	6	27	2.2	4	3	70	4.9	2	2	97
.6	4	3	31	2.3	1	1	71	5.1	1	1	98
.7	4	3	34	2.6	5	4	75	5.4	1	1	98
.8	7	6	40	2.8	2	2	77	5.7	1	1	99
.9	3	2	42	2.9	3	2	79	5.9	1	1	100

M I S S I N G D A T A

VALUE	FREQ	VALUE	FREQ	VALUE	FREQ
	16				

VALID CASES 121 MISSING CASES 16

Figure 19. Frequency distribution of pretest-posttest grade equivalent changes for Mathematics Comprehension Test. (The data appear in three sets of four columns. The "valve" is the grade equivalent valve.)

Summary/Recommendations

Individualized reading and mathematics instructional series were used during the 39-day instructional program in an effort to improve the basic skills of the 216 clients served by the program. Major incentives that were offered to clients include the opportunity to earn a full academic credit, a $200 bonus for successfully completing the program, and an hourly rate of pay for their participation.

Despite problems with recruitment and data collection, the evaluation data indicated that the program was successful in improving the basic skills of the clients in the areas of reading comprehension and mathematics computation. The analyses of the pretest-posttest data used to answer the questions in the program evaluation design showed that there were statistically significant improvement in both reading and mathematics for the number of items correctly answered and the number of objective mastered. The analysis of the grade equivalent data indicated that the median gain was 8 months in reading and 11 months in mathematics for the two-month program.

The following summary statements are based on both formal evaluation activities and discussions with program personnel.

1. The clients did show substantial growth in reading and mathematics. To more clearly demonstrate that the growth was due to the program, procedures should be established to obtain data from a comparison group who did not receive the instructional program. Many of the problems in setting up this comparison group could be resolved by staring recruitment in January and in setting up alternative procedures to collect posttest data.

2. Many of the other constraints experienced by the program during the first year could be resolved by staring activities earlier. This includes teacher recruitment and selection.

3. The number of clients should be increased. Money spent on improving basic skills may well have more long-term benefits than spending funds on low level jobs.

In general, if a larger number of clients were served with an adequate comparison group, data could be collected to determine curricular areas where the program could have the greatest impact. It is possible that the program could have even greater benefit, if it were better coordinated with the regular school program for those clients still attending school. With the availability of more process and product evaluation data, it might be possible to further refine a program that has demonstrated potential for improving the basic skills of a client group with a demonstrated need for such a program.

Reference

CTB/McGraw-Hill Staffwriters. Comprehensive Tests of Basic Skills. Monterey, California: CTB/McGraw-Hill, 1981.